



**PATENT APPLICATION**  
**Attorney Docket No. A3401-US-NP**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s): Yiliang Wu et al.

Application No.: 10/733,136

Filed: 12/11/2003

Confirmation No.: 7393

Examiner: Brian Talbot

Art Unit: 1762

Title: NANOPARTICLE DEPOSITION PROCESS

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on

6/28/2005

(Date of deposit)

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

*Francie S. LePore*  
Francie S. LePore

Sir:

**DECLARATION UNDER 37 CFR 1.131**

We, Yiliang Wu, Yuning Li, and Beng S. Ong, hereby declare as follows:

1. We are the listed inventors in the above-identified patent application.
2. We have reviewed D. Huang et al., "Plastic-Compatible Low Resistance Printable Gold Nanoparticle Conductors for Flexible Electronics", *Journal of The Electrochemical Society*, Vol. 150, No. 7, pp. G412-G417 (Available electronically May 30, 2003).
3. Prior to May 30, 2003 but subsequent to January 1, 2002 (referred herein as "Prior Time Period"), our invention as claimed in the above-identified patent application was conceived and reduced to practice in Canada.

4. As evidence of conception and reduction to practice during the Prior Time Period, we are attaching two pages (photocopies) from our laboratory notebooks which describe embodiment(s) of the present invention, where each page is completed and signed and dated by a co-inventor (and also signed and dated by a witness) during the Prior Time Period. Any blanked out dates in said laboratory notebook pages are all during the Prior Time Period.


5. We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Respectfully submitted,



Yiliang Wu

Date: June 27, 2005



Yuning Li

Date: June 29, 2005



Beng S. Ong

Date: June 27, 2005

DATE

SUBJECT

PROJECT NO.

Spin coating gold nanoparticles from chloroform solution Au-C8 (octyl)

annealing the thin film at  $140^{\circ}\text{C}$  in vacuum measure conductivity by SCS 4200 system

the film is very conductive

we can use gold nanoparticle as printable precursor to print electrodes for OTFT /

try microcontact printing gold nanoparticles as electrode (source drain) for OTFT device

May 12 Spin coating gold nanoparticles annealing at  $140^{\circ}\text{C}$  in vacuum for 2h measure conductivity using 4-probe technique

conductivity:  $\sim 300$  to  $1000 \text{ S/cm}$

WITNESSED AND UNDERSTOOD

SIGNED

SIGNED

DATE

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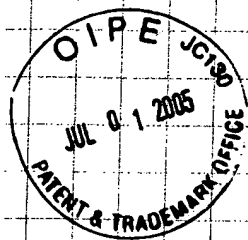
WORK AND RECORD

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SUBJECT Synthesis of Au particles

PROJECT NO. XYL001

$(n-(8H17)_4MSr + HAuCl_4 \cdot 3H_2O) + NaBH_4 \rightarrow$  protected Au particles  
 4 mmol 1 mmol 10 mmol  
 2.19g 0.394g 0.378g

+  
 1-Octanethiol  
 3 mmol  
 0.435g

←  $(n-(8H17)_6MSr$

← Toluene 8cmL

←  $HAuCl_4 \cdot 3H_2O$  in 100 mL H<sub>2</sub>O  
Organic layer became red

← 1-Octanethiol in 30 mL toluene  
Became colorless

←  $NaBH_4$  in 100 mL H<sub>2</sub>O at 0°C  
Became black

Stirred overnight 18 hr  
 Separated organic layer, dried over  $MgSO_4$

Filtration

Evaporate solvents (bath 40°C) to concentrate to small  
 precipitate to 100 mL methanol black solid. Centrifuge separate  
 solid was dried under vacuum. Redissolved in hexane (toluene  
 is better) precipitate to methanol. Solid collected.

Yield: ① 4.774g - 9.585g = 2.189g

② Recycled 2.05g

The product was dried under vacuum (2 hr).

The sample was given to Yiliang for conductivity testing.

WITNESSED AND UNDERSTOOD

SIGNED

SIGNED

Carl Song  
 DATE  
 DATE

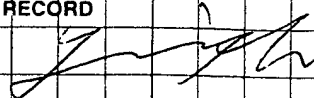
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